

## ***Interactive comment on “Mapping the adaptation solution space – lessons from Jakarta for other coastal cities” by Mia Wannewitz and Matthias Garschagen***

### **Anonymous Referee #2**

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The paper presents a summary of scientific papers recognised in the Scopus database using “Jakarta” and “flood” as keywords, with the aim of mapping the “solution space” for mitigation or adaptation strategies to cope with the long-standing and thorny problem of flooding for the city of Jakarta.

I have major concerns with the paper for the reasons reported below.

#### 1) SUITABILITY TO NHESS JOURNAL

Consider that NHESS is a journal for high-quality studies and original research on natural hazards and their consequences. The design, implementation, and critical evaluation of mitigation and adaptation strategies are included, but the present paper only

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reports a confuse collections of mitigation and adaptation strategies found in bibliographic items about floods in Jakarta. I stress that this piece is not a critical evaluation of mitigation and adaptation strategies as it lacks the rigour and the in-depth analyses that are necessary ingredients of a “critical evaluation”. It is rather a jumble of contrasting opinions, which share the goal of criticizing any possible solution to flooding in Jakarta. The final solution supported by the Authors is nothing more than a praise of as saving as vague “hybrid adaptation approaches”.

#### 2) GENERAL SCOPE

In the title, “lessons from Jakarta for other coastal cities” is inappropriate. I suggest something as “Mapping the solution space for adaptation and protection from flood in Jakarta”. While it is obvious that a good work in a specific context can be of inspiration (and provide lessons) for other similar situations, this aspect must not be referenced in the title, as the present paper is not intended, nor is structured, to draw general conclusions to be applied to other coastal cities. It only assesses (with significant limitations) the specific case of Jakarta, and I do not see much broader implications.

#### 3) METHOD OF ANALYSIS

The paper analyses the number of papers in Scopus dealing with different approaches and solutions. I don't feel that the number of scientific papers is a good criterion to judge the attention given to different approaches and solutions, nor the number of papers can actually determine adaptation policies. The number of papers on specific aspects could simply indicate that some issues are multifaceted and more complex than other, thus deserving greater effort and more studies. I believe that it is more complex to assess flood hazard with the due effectiveness, accuracy and reliability, than for example assessing the exposure of people and assets. It is more difficult, and more important, to assess the real mechanisms of flood hazard correctly, then considering the uncertain future scenarios associated to climate and land use change scenarios. In this view, it seems perfectly natural to see (let's say) ten papers dealing with hydrology

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and the physics of flooding, and two paper on future hypothetical scenarios.

Furthermore, I believe that literature reviews (as the present paper actually is) should look at the scientific literature realistically. It is necessary to consider the biases that unavoidably affect the scientific production before drawing conclusions. For example, it is well-known that scientists are led to increase their scientific production enormously, with an increasing number of articles and with an inevitable reduction in research quality. The plot of Figure 2, which show an increase of papers focusing on Jakarta and floods, should be compared to the trend of research papers in the same field (e.g., concerning only “flood”).

Finally, according to the two previous points, I stress that judgements based on the number of papers should be avoided (or, at least, significantly limited) in the present paper, and the attention should always be brought back to the contents of scientific papers. In other words, a single paper reporting a comprehensive analysis is more important than 20 paper written to enlarge the publication record of authors eager for career advancement.

#### 4) MISSING BACKGROUND INFORMATION

For a reader that does not know much of flood hazard in Jakarta, it is difficult to forge a proper idea about the different countermeasures to flood hazard/risk listed in the paper. A paragraph should be added that summarize the main source of risk in Jakarta (e.g., coastal and/or river flooding), the areas interested by each different flooding mechanisms, the mean flow depth that is expected. This is a fundamental aspect because, for example, “soft” measures are almost useless in the case of frequent flooding with water depth of more than 1 m (either you leave the area, or you keep water away, no half measures); completely different is the case of nuisance flooding.

#### 5) OUTCOMES OF THE STUDY

Basically, previous literature studies are divided in two families: engineering pieces

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dealing with physical aspects and infrastructural solutions from a “protection from flooding” perspective, that are associated to technocratic solutions, and (generally qualitative) pieces dealing with soft adaptation and associated to bottom-up, more sustainable and comprehensive solutions. The first approach is criticized as outdated and possibly ineffective. The second approach is criticized as lacking concrete recommendations on how to achieve better goals.

I feel that the paper elaborates on a great misunderstanding. Structural interventions unavoidably entail negative impacts, but here the criticism of design choices because, as it seems, they are associated to the interests of the wealthiest classes, is confused with the criticism of technical solutions.

In summary, on one hand the paper turns out to be a critique of the Great Garuda Project (a major structural intervention that is to be built). I do not claim that the Great Garuda Project is a right choice or not, the problem here is that the motivation against the Great Garuda Project are not clearly reported nor analysed in the paper! The alternatives to the Great Garuda Project, and to the classic engineering approach of “protection from flood”, are extremely vague, unsubstantiated, not analyzed in depth and, indeed, of dubious utility considering the extent of the flood risk. Indeed, the analysis neglects a fundamental aspect: soft measures are almost useless against hard flooding.

Much of the conclusions reported in the paper are not supported, nor they are the logical conclusion of the given premises. For example (l. 451-453) “the pursuit of such infrastructural measures despite their questionable effectiveness and major critique shows that the city government sticks to its traditional protection approach”. Are there effective alternatives to infrastructural measures? This issue is not clearly addressed in the paper, so the conclusion that “the city government sticks to its traditional protection approach” is not the logical consequence. If an “outdated” structural measure is the only effective solution to a present problem, even a government devoted to the future would be obliged to choose this one.

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#### MINOR COMMENTS

-l. 29: Tellmann et al. (2020) and Wolff et al. (2020) are missing in the bibliography.

-l. 130: Figure 4, not 3.

-l. 324: "While there hence exists. . ." is an awkward construction.

-l. 419: please introduce DRR acronym.

-l. 773: the title of the paper is repeated two times.

-An analysis of a coastal area affected by land subsidence, flooding and population dynamics, is reported in <https://doi.org/10.1016/j.scitotenv.2018.09.121>

-Two examples of adaptation measures supported by technical studies are <https://doi.org/10.1016/j.ejrh.2020.100702> and <https://doi.org/10.3390/w12061609>

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2020-370>, 2020.